

## CLAIMS

WHAT IS CLAIMED IS:

1. A device comprising:

5 a light source comprising a plurality of lasers  
capable of oscillating at a plurality of wavelengths;

a periodic filter having a periodic transmittance-  
wavelength characteristic for receiving laser light output  
from said light source;

10 light detecting means for receiving laser light output  
from said periodic filter and detecting light intensity of the  
received laser light; and

controlling means for generating oscillation any one  
of said plurality lasers of at a desired wavelength and for  
controlling an oscillation wavelength of the laser so that an  
15 output value of said light detecting means becomes equal to  
a target value corresponding to said desired wavelength among  
a plurality of target values respectively set for each of said  
plurality of wavelengths.

2. A device according to claim 1, wherein:

20 laser light output from said light source has nearly  
constant wavelength spacing;

a length of a period of said periodic filter is  
substantially equal to a length of said wavelength spacing;  
and

25 each of said plurality of target values is set at a  
value between two adjacent extremums of said  
transmittance-wavelength characteristic.

3. A device according to claim 2, wherein a target value  
corresponding to a center wavelength of said plurality of  
30 wavelengths is set at a value at approximately the center of  
two adjacent extremums of said transmittance-wavelength  
characteristic.

4. A device according to claim 2, wherein said  
controlling means controls said oscillation wavelength after  
35 generating oscillation of said one laser at a wavelength which  
is in a range including a wavelength approximately at the  
center of two adjacent extremums of said transmittance-

wavelength characteristic, the range included in ranges between said desired wavelength and a wavelength closest to said desired wavelength and having an extremum of said transmittance-wavelength characteristic.

5 5. A device according to claim 2, wherein said controlling means controls said oscillation wavelength after generating oscillation of said one laser at a wavelength which is closest to said desired wavelength and is approximately at the center of two adjacent extremums of said  
10 transmittance-wavelength characteristic.

6. A device according to claim 2, further comprising optical amplifying means for amplifying laser light to be output to an exterior.

7. A device according to claim 6, wherein said optical  
15 amplifying means is used in a saturation range.

8. A device according to claim 2, wherein said plurality of lasers are semiconductor lasers; and

said controlling means controls said oscillation wavelength by controlling device temperature of said one  
20 laser.

9. A device according to claim 2, wherein said plurality of lasers are semiconductor lasers; and

said controlling means controls said oscillation wavelength by controlling driving current of said one laser.

25 10. A device according to claim 2, wherein said plurality of lasers are semiconductor lasers; and

said controlling means controls device temperature of said one laser when generating oscillation of said one laser and controls driving current of said one laser when controlling  
30 said oscillation wavelength.

11. A device according to claim 1, wherein said periodic filter is a plurality of filters whose transmittance-wavelength characteristics are the same in period and temperature dependence; and

35 the number of said light detecting means corresponds with the number of said plurality of filters.

12. A device according to claim 11, wherein laser light

output from said light source has nearly constant wavelength spacing;

each of said spacing is divided into a plurality of wavelength ranges; and

- 5 each of said wavelength ranges is respectively within ranges between two adjacent extremums of said transmittance-wavelength characteristics of said plurality of filters.

- 10 13. A device according to claim 1, wherein said periodic filter has temperature dependence, which is said transmittance-wavelength characteristic, in accordance with temperature dependence of an oscillation wavelength of said plurality of lasers.

14. A device comprising:

- 15 a laser capable of oscillating at a plurality of wavelengths;

a periodic filter for receiving laser light output from said laser, which transmittance-wavelength characteristic is temperature dependence in accordance with temperature dependence of an oscillation wavelength of said laser and;

- 20 light detecting means for receiving laser light output from said periodic filter and detecting light intensity of the received laser light; and

- 25 controlling means for generating oscillation of said laser at one of said plurality of wavelengths and controlling an oscillation wavelength of laser light output from said laser so that an output value of said light detecting means becomes equal to a target value that is commonly set for each of said  
30 plurality of wavelengths.